

## **Metabolic profiling of *Candida* clinical isolates of different species and infection sources**

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## Supplementary information

**Table S1: Infection source and virulence factors of *Candida* strains.**

Strain number	Acc. Num. (GenBank)	Species	Source	Biofilm	SAP activity (mm)	Amphoter-B	Fluconazole	Caspofungin
24	MT876150	<i>C. albicans</i>	R	0	N	S (0,03)	S (1)	S (0,015)
25	MT876145	<i>C. glabrata</i>	R	1	N	S (0,125)	R (>32)	S (0,0625)
26	MT876175	<i>C. albicans</i>	R	3	N	S (0,0625)	S (0,5)	S (0,015)
28	MT876158	<i>C. albicans</i>	R	1	P (12)	S (0,03)	R (>32)	S (0,015)
29	MT876184	<i>C. albicans</i>	R	0	P (7)	S (0,03)	R (>32)	S (0,015)
30	MT876144	<i>C. tropicalis</i>	R	3	N	S (0,125)	R (>32)	S (0,03)
31	MT876151	<i>C. parapsilosis</i>	B	2	P (2)	S (0,0625)	S (1)	I (0,125)
33	MT876147	<i>C. parapsilosis</i>	R	1	P (2)	S (0,0625)	I (4)	S (0,25)
44	MT876146	<i>C. glabrata</i>	R	1	N	S (0,0625)	R (>32)	S (0,0625)
46	MT876136	<i>C. glabrata</i>	R	0	N	S (0,125)	R (>32)	S (0,0625)
47	MT876153	<i>C. glabrata</i>	V	0	N	S (0,125)	R (>32)	S (0,03)
48	MT876152	<i>C. glabrata</i>	V	0	N	S (0,125)	R (>32)	S (0,03)
51	MT876138	<i>C. parapsilosis</i>	B	2	N	S (0,0625)	S (0,5)	S (0,25)
52	MT876148	<i>C. parapsilosis</i>	B	2	N	S (<=0,007)	S (<=0,25)	S (<=0,007)
53	MT876137	<i>C. parapsilosis</i>	B	3	P (5)	S (0,03)	S (2)	S (0,25)
59	MT876169	<i>C. albicans</i>	B	2	P (2)	S (0,03)	R (>32)	S (0,03)
60	MT876179	<i>C. albicans</i>	B	1	P (3)	S (0,03)	S (1)	S (0,03)
61	MT876163	<i>C. albicans</i>	B	1	N	S (0,03)	S (0,5)	S (0,03)
66	MT876170	<i>C. albicans</i>	B	1	N	S (0,03)	S (1)	S (0,03)
67	MT876154	<i>C. glabrata</i>	B	2	N	S (0,125)	R (>32)	S (0,0625)
71	MT876167	<i>C. albicans</i>	V	2	N	S (<=0,007)	S (<=0,25)	S (<=0,007)
72	MT876161	<i>C. albicans</i>	V	1	N	S (0,03)	S (0,5)	S (0,015)
73	MT876140	<i>C. glabrata</i>	V	1	N	S (0,0625)	R (>32)	S (0,0625)
74	MT876139	<i>C. glabrata</i>	V	0	N	S (0,03)	R (>32)	S (0,0625)
75	MT876143	<i>C. glabrata</i>	V	1	N	S (0,125)	R (>32)	S (0,0625)
76	MT876142	<i>C. glabrata</i>	V	0	N	S (0,25)	R (>32)	S (0,0625)
77	MT876168	<i>C. albicans</i>	V	1	P (3)	S (0,03)	S (1)	S (0,015)
78	MT876141	<i>C. albicans</i>	V	0	P (5)	S (0,0625)	S (0,5)	S (0,015)
79	MT876176	<i>C. albicans</i>	V	0	N	S (0,0625)	S (0,5)	S (0,015)
80	MT876173	<i>C. albicans</i>	B	0	P (2)	S (0,03)	S (0,5)	S (0,015)
81	MT876178	<i>C. albicans</i>	B	0	N	S (0,0625)	S (1)	S (0,015)
83	MT876156	<i>C. parapsilosis</i>	B	2	P (2)	S (0,0625)	S (1)	S (0,25)
85	MT876165	<i>C. albicans</i>	V	1	N	S (0,03)	S (0,5)	S (0,015)
86	MT876159	<i>C. albicans</i>	R	1	N	S (0,03)	S (0,5)	S (0,015)
87	MT876166	<i>C. albicans</i>	V	0	N	S (0,03)	S (0,5)	S (0,015)
88	MT876160	<i>C. albicans</i>	V	1	N	S (0,0625)	S (0,5)	S (0,015)
89	MT876183	<i>C. albicans</i>	V	0	P (5)	S (0,0625)	R (>32)	S (0,015)
91	MT876162	<i>C. dubliniensis</i>	R	1	N	S (0,015)	S (<=0,25)	R (>1)
92	MT876149	<i>C. albicans</i>	R	0	N	S (0,03)	S (0,5)	S (0,03)
93	MT876172	<i>C. albicans</i>	R	1	N	S (0,0625)	S (0,5)	S (0,03)
94	MT876174	<i>C. albicans</i>	V	0	P (1)	S (0,03)	S (0,5)	S (0,03)
95	MT876164	<i>C. albicans</i>	V	0	N	S (0,03)	S (0,5)	S (0,03)
96	MT876181	<i>C. albicans</i>	V	2	N	S (0,03)	S (1)	S (0,015)
97	MT876180	<i>C. albicans</i>	R	2	P (3)	S (0,03)	S (1)	S (0,015)
98	MT876177	<i>C. albicans</i>	B	2	P (4)	S (0,03)	S (1)	S (0,015)
99	MT876171	<i>C. albicans</i>	B	2	P (1)	S (0,03)	S (1)	S (0,015)
100	MT876155	<i>C. tropicalis</i>	R	3	P (5)	S (0,125)	R (>32)	S (0,03)
103	MT876157	<i>C. tropicalis</i>	B	2	P (5)	S (<=0,007)	S (1)	S (<=0,007)
104	MT876182	<i>C. albicans</i>	R	2	N	S (0,0625)	S (2)	S (0,03)

Source: R=RESPIRATORY SAMPLES; B=BLOOD SAMPLES; V=VAGINAL SWAB

Biofilm formation: 0=NON PRODUCER; 1=WEAK PRODUCER; 2=INTERMEDIATE PRODUCER; 3=STRONG PRODUCER. The activity was measured as absorbance at 595 nm.

SAP activity: N=NON-PRODUCER; P=PRODUCER; In brackets diameter of the visible clear zone around the colony after 1 week of incubation at 37°C in humidified chamber.

Antifungal susceptibility testing (Amphotericin-B, Fluconazole and Caspofungin): S=SUSCEPTIBLE; I=INTERMEDIATE; R=RESISTANT (interpretation following EUCAST antifungal clinical breakpoints); In brackets MIC values.

**Table S2: Concentration (mmol/L, mean  $\pm$  sd) of *Candida* extracellular metabolites significantly different in relation to the source of infection, expressed as difference from growth medium.**

	Respiratory tract	Vagina	Blood
Inosine	$1.58 \times 10^{-3} \pm 2.42 \times 10^{-3}$ ab	$2.58 \times 10^{-3} \pm 3.80 \times 10^{-3}$ a	$5.47 \times 10^{-5} \pm 1.76 \times 10^{-3}$ b *
1,3-Dihydroxyacetone	$1.62 \times 10^{-3} \pm 4.34 \times 10^{-4}$ a	$1.08 \times 10^{-3} \pm 7.11 \times 10^{-4}$ b	$1.21 \times 10^{-3} \pm 7.34 \times 10^{-4}$ ab
Hydroxyacetone	$5.88 \times 10^{-3} \pm 2.83 \times 10^{-3}$ a	$4.47 \times 10^{-3} \pm 2.46 \times 10^{-3}$ ab	$2.55 \times 10^{-3} \pm 2.52 \times 10^{-3}$ b
Choline	$-1.62 \times 10^{-2} \pm 2.11 \times 10^{-2}$ ab	$-8.68 \times 10^{-3} \pm 2.09 \times 10^{-2}$ a	$-2.11 \times 10^{-2} \pm 1.10 \times 10^{-2}$ b
Putrescine	$-2.52 \times 10^{-3} \pm 5.92 \times 10^{-3}$ ab	$-3.71 \times 10^{-3} \pm 6.82 \times 10^{-3}$ b	$4.00 \times 10^{-3} \pm 1.15 \times 10^{-2}$ a
Lysine	$1.08 \times 10^{-1} \pm 5.24 \times 10^{-2}$ ab	$1.33 \times 10^{-1} \pm 3.94 \times 10^{-2}$ a	$7.37 \times 10^{-2} \pm 7.44 \times 10^{-2}$ b
Citrate	$3.47 \times 10^{-1} \pm 1.24 \times 10^{-1}$ ab	$4.09 \times 10^{-1} \pm 5.87 \times 10^{-2}$ a	$3.22 \times 10^{-1} \pm 9.13 \times 10^{-2}$ b
Succinate	$5.29 \times 10^{-1} \pm 1.78 \times 10^{-1}$ a	$4.15 \times 10^{-1} \pm 1.87 \times 10^{-1}$ ab	$2.92 \times 10^{-1} \pm 2.16 \times 10^{-1}$ b
Alloisoleucine	$5.14 \times 10^{-1} \pm 1.63 \times 10^{-1}$ a	$4.78 \times 10^{-1} \pm 2.51 \times 10^{-1}$ ab	$3.50 \times 10^{-1} \pm 1.92 \times 10^{-1}$ b
Ethanol	$92.3 \pm 21.9$ a	$87.8 \pm 24.3$ ab	$70.2 \pm 33.2$ b
2,3-Butanediol	$2.64 \times 10^{-1} \pm 1.45 \times 10^{-1}$ a	$1.78 \times 10^{-1} \pm 7.80 \times 10^{-2}$ ab	$1.68 \times 10^{-1} \pm 1.86 \times 10^{-1}$ b
Isobutyrate	$1.62 \times 10^{-2} \pm 9.45 \times 10^{-3}$ a	$6.71 \times 10^{-3} \pm 6.10 \times 10^{-3}$ b	$1.01 \times 10^{-2} \pm 1.08 \times 10^{-2}$ ab

\* Compact letters display of the comparisons between each pair of groups, where two mean values followed by a common superscript are not significantly different.

**Table S3: Concentration (mmol/L, mean  $\pm$  sd) of *Candida* intracellular metabolites significantly different in relation to the source of infection.**

	Respiratory tract	Vagina	Blood
ADP	$2.77 \times 10^{-3} \pm 9.97 \times 10^{-4}$ a	$1.89 \times 10^{-3} \pm 5.46 \times 10^{-4}$ b	$2.62 \times 10^{-3} \pm 8.93 \times 10^{-4}$ a *
NAD	$6.95 \times 10^{-3} \pm 1.10 \times 10^{-3}$ a	$5.69 \times 10^{-3} \pm 1.53 \times 10^{-3}$ b	$6.44 \times 10^{-3} \pm 1.58 \times 10^{-3}$ ab
UMP	$1.22 \times 10^{-2} \pm 2.88 \times 10^{-3}$ a	$8.40 \times 10^{-3} \pm 2.48 \times 10^{-3}$ b	$1.09 \times 10^{-2} \pm 3.03 \times 10^{-3}$ a
Uracil	$7.97 \times 10^{-3} \pm 1.93 \times 10^{-3}$ a	$6.16 \times 10^{-3} \pm 1.42 \times 10^{-3}$ b	$6.76 \times 10^{-3} \pm 1.90 \times 10^{-3}$ ab
Creatinine	$5.72 \times 10^{-3} \pm 2.57 \times 10^{-3}$ ab	$7.29 \times 10^{-3} \pm 3.58 \times 10^{-3}$ a	$4.64 \times 10^{-3} \pm 2.21 \times 10^{-3}$ b
Lysine	$4.86 \times 10^{-2} \pm 2.05 \times 10^{-2}$ ab	$3.41 \times 10^{-2} \pm 1.16 \times 10^{-2}$ b	$6.06 \times 10^{-2} \pm 4.78 \times 10^{-2}$ a
Aspartate	$5.43 \times 10^{-2} \pm 2.13 \times 10^{-2}$ a	$3.45 \times 10^{-2} \pm 1.86 \times 10^{-2}$ b	$4.07 \times 10^{-2} \pm 2.13 \times 10^{-2}$ ab
Pyruvate	$1.91 \times 10^{-2} \pm 1.01 \times 10^{-2}$ a	$2.90 \times 10^{-2} \pm 1.17 \times 10^{-2}$ b	$2.01 \times 10^{-2} \pm 1.33 \times 10^{-2}$ a
2-Aminobutyrate	$4.86 \times 10^{-3} \pm 1.47 \times 10^{-3}$ ab	$4.50 \times 10^{-3} \pm 1.06 \times 10^{-3}$ b	$5.61 \times 10^{-3} \pm 1.52 \times 10^{-3}$ a

\* Compact letters display of the comparisons between each pair of groups, where two mean values followed by a common superscript are not significantly different.

**Table S4: Concentration (mmol/L, mean  $\pm$  sd) of extracellular metabolites significantly different in relation to *Candida* species, expressed as difference from growth medium.**

	<i>C. albicans</i> complex	<i>C. glabrata</i>	<i>C. parapsilosis</i>	<i>C. tropicalis</i>
Phenylalanine	$6.15 \times 10^{-2} \pm 2.43 \times 10^{-2}$ a *	$-7.18 \times 10^{-3} \pm 3.67 \times 10^{-2}$ bc	$-3.63 \times 10^{-2} \pm 4.10 \times 10^{-2}$ c	$3.62 \times 10^{-2} \pm 1.82 \times 10^{-2}$ ab
Tyrosine	$3.01 \times 10^{-2} \pm 7.80 \times 10^{-3}$ b	$4.57 \times 10^{-2} \pm 1.70 \times 10^{-2}$ a	$2.25 \times 10^{-2} \pm 8.14 \times 10^{-3}$ b	$3.88 \times 10^{-2} \pm 6.31 \times 10^{-3}$ ab
Fumarate	$3.34 \times 10^{-2} \pm 1.39 \times 10^{-2}$ a	$1.18 \times 10^{-2} \pm 4.53 \times 10^{-3}$ b	$8.29 \times 10^{-3} \pm 2.76 \times 10^{-3}$ b	$1.43 \times 10^{-2} \pm 5.05 \times 10^{-3}$ b
Orotate	$1.36 \times 10^{-3} \pm 6.07 \times 10^{-4}$ ab	$1.91 \times 10^{-3} \pm 6.47 \times 10^{-4}$ a	$1.22 \times 10^{-3} \pm 7.66 \times 10^{-4}$ ab	$7.68 \times 10^{-4} \pm 7.04 \times 10^{-4}$ b
Inosine	$3.73 \times 10^{-4} \pm 1.36 \times 10^{-3}$ b	$6.40 \times 10^{-3} \pm 2.55 \times 10^{-3}$ a	$-2.93 \times 10^{-4} \pm 1.30 \times 10^{-3}$ b	$-2.45 \times 10^{-4} \pm 8.16 \times 10^{-4}$ b
Cytidine	$-1.06 \times 10^{-3} \pm 1.57 \times 10^{-3}$ b	$4.78 \times 10^{-3} \pm 2.40 \times 10^{-3}$ a	$3.12 \times 10^{-3} \pm 2.07 \times 10^{-3}$ a	$-2.84 \times 10^{-3} \pm 8.72 \times 10^{-5}$ b
Guanosine	$-1.77 \times 10^{-3} \pm 1.26 \times 10^{-3}$ b	$3.62 \times 10^{-3} \pm 1.63 \times 10^{-3}$ a	$1.92 \times 10^{-3} \pm 1.36 \times 10^{-3}$ a	$-3.53 \times 10^{-3} \pm 1.30 \times 10^{-3}$ b
Uracil	$5.66 \times 10^{-3} \pm 2.19 \times 10^{-3}$ b	$-8.81 \times 10^{-4} \pm 1.55 \times 10^{-3}$ c	$3.97 \times 10^{-3} \pm 2.39 \times 10^{-3}$ b	$3.77 \times 10^{-2} \pm 7.51 \times 10^{-3}$ a
Sucrose	$1.48 \times 10^{-2} \pm 3.69 \times 10^{-3}$ b	$2.14 \times 10^{-2} \pm 3.80 \times 10^{-3}$ a	$1.55 \times 10^{-2} \pm 4.24 \times 10^{-3}$ b	$-2.51 \times 10^{-2} \pm 1.50 \times 10^{-2}$ c

Ribose	$-6.65 \times 10^{-2} \pm 2.22 \times 10^{-2b}$	$-7.65 \times 10^{-2} \pm 1.80 \times 10^{-2b}$	$-3.40 \times 10^{-2} \pm 2.03 \times 10^{-2a}$	$-9.61 \times 10^{-2} \pm 1.65 \times 10^{-3c}$
Mannose	$2.04 \times 10^{-2} \pm 1.67 \times 10^{-2b}$	$3.09 \times 10^{-3} \pm 2.16 \times 10^{-2c}$	$6.33 \times 10^{-2} \pm 1.83 \times 10^{-2a}$	$-1.28 \times 10^{-2} \pm 9.88 \times 10^{-3c}$
1,3-Dihydroxyacetone	$1.34 \times 10^{-3} \pm 6.26 \times 10^{-4ab}$	$9.86 \times 10^{-4} \pm 6.68 \times 10^{-4b}$	$1.19 \times 10^{-3} \pm 7.52 \times 10^{-4ab}$	$2.17 \times 10^{-3} \pm 1.43 \times 10^{-4a}$
Hydroxyacetone	$4.30 \times 10^{-3} \pm 2.16 \times 10^{-3ab}$	$6.39 \times 10^{-3} \pm 3.54 \times 10^{-3a}$	$8.63 \times 10^{-4} \pm 1.50 \times 10^{-3b}$	$4.94 \times 10^{-3} \pm 3.39 \times 10^{-3ab}$
Threonine	$-4.38 \times 10^{-1} \pm 5.81 \times 10^{-2ab}$	$-3.99 \times 10^{-1} \pm 7.82 \times 10^{-2ab}$	$-3.74 \times 10^{-1} \pm 5.89 \times 10^{-2a}$	$-4.74 \times 10^{-1} \pm 2.00 \times 10^{-3b}$
Lactate	$6.56 \times 10^{-2} \pm 7.36 \times 10^{-2a}$	$6.38 \times 10^{-3} \pm 3.40 \times 10^{-2ab}$	$7.74 \times 10^{-2} \pm 6.79 \times 10^{-2a}$	$1.62 \times 10^{-2} \pm 1.54 \times 10^{-2ab}$
Arabinitol	$1.85 \times 10^{+0} \pm 1.13 \times 10^{+0a}$	$-3.83 \times 10^{-2} \pm 2.98 \times 10^{-2b}$	$2.61 \times 10^{+0} \pm 1.52 \times 10^{+0a}$	$1.21 \times 10^{+0} \pm 7.46 \times 10^{-1a}$
Methanol	$-5.15 \times 10^{-3} \pm 3.64 \times 10^{-3a}$	$-3.79 \times 10^{-3} \pm 2.98 \times 10^{-3a}$	$-1.01 \times 10^{-2} \pm 1.02 \times 10^{-3b}$	$-2.74 \times 10^{-3} \pm 2.35 \times 10^{-3a}$
Glucose	$-3.28 \times 10^{+1} \pm 9.90 \times 10^{+0ab}$	$-3.77 \times 10^{+1} \pm 8.34 \times 10^{+0bc}$	$-1.92 \times 10^{+1} \pm 9.73 \times 10^{+0a}$	$-4.57 \times 10^{+1} \pm 5.77 \times 10^{-2c}$
Choline	$-2.11 \times 10^{-2} \pm 6.70 \times 10^{-3b}$	$1.56 \times 10^{-2} \pm 2.02 \times 10^{-2a}$	$-2.96 \times 10^{-2} \pm 1.25 \times 10^{-3c}$	$-2.55 \times 10^{-2} \pm 4.36 \times 10^{-4bc}$
Putrescine	$-1.24 \times 10^{-3} \pm 9.69 \times 10^{-3ab}$	$-5.48 \times 10^{-3} \pm 6.45 \times 10^{-3b}$	$6.12 \times 10^{-3} \pm 3.19 \times 10^{-3a}$	$2.73 \times 10^{-3} \pm 2.86 \times 10^{-3ab}$
Lysine	$1.32 \times 10^{-1} \pm 3.71 \times 10^{-2a}$	$1.08 \times 10^{-1} \pm 2.87 \times 10^{-2a}$	$-7.73 \times 10^{-3} \pm 7.00 \times 10^{-2b}$	$7.49 \times 10^{-2} \pm 2.35 \times 10^{-2a}$
Asparagine	$-1.64 \times 10^{-1} \pm 2.16 \times 10^{-2b}$	$-1.15 \times 10^{-1} \pm 3.85 \times 10^{-2a}$	$-1.62 \times 10^{-1} \pm 1.01 \times 10^{-2b}$	$-1.73 \times 10^{-1} \pm 5.20 \times 10^{-3b}$
Sarcosine	$1.17 \times 10^{-3} \pm 3.69 \times 10^{-3a}$	$-1.05 \times 10^{-2} \pm 3.79 \times 10^{-3b}$	$5.46 \times 10^{-4} \pm 2.95 \times 10^{-3a}$	$-3.23 \times 10^{-3} \pm 4.83 \times 10^{-3a}$
Malate	$-1.52 \times 10^{-2} \pm 2.62 \times 10^{-2b}$	$3.33 \times 10^{-2} \pm 2.85 \times 10^{-2a}$	$-3.81 \times 10^{-2} \pm 2.32 \times 10^{-2bc}$	$-4.78 \times 10^{-2} \pm 2.06 \times 10^{-2c}$
Succinate	$3.95 \times 10^{-1} \pm 1.48 \times 10^{-1b}$	$5.65 \times 10^{-1} \pm 1.68 \times 10^{-1a}$	$8.81 \times 10^{-2} \pm 3.38 \times 10^{-2c}$	$7.67 \times 10^{-1} \pm 6.25 \times 10^{-2a}$
Pyruvate	$6.20 \times 10^{+0} \pm 2.88 \times 10^{+0a}$	$7.06 \times 10^{+0} \pm 2.42 \times 10^{+0a}$	$1.02 \times 10^{+0} \pm 6.19 \times 10^{-1b}$	$1.22 \times 10^{+0} \pm 7.88 \times 10^{-1b}$
p-cresol	$2.70 \times 10^{-3} \pm 2.75 \times 10^{-3b}$	$2.94 \times 10^{-3} \pm 1.86 \times 10^{-3ab}$	$6.58 \times 10^{-3} \pm 4.47 \times 10^{-3ab}$	$8.52 \times 10^{-3} \pm 4.12 \times 10^{-3a}$
Acetone	$-3.34 \times 10^{-3} \pm 2.43 \times 10^{-3b}$	$-4.82 \times 10^{-4} \pm 2.67 \times 10^{-3a}$	$-1.99 \times 10^{-3} \pm 3.01 \times 10^{-3ab}$	$-1.46 \times 10^{-3} \pm 3.38 \times 10^{-3ab}$
Methionine	$-6.37 \times 10^{-2} \pm 3.73 \times 10^{-2a}$	$-1.22 \times 10^{-1} \pm 3.30 \times 10^{-2b}$	$-2.18 \times 10^{-2} \pm 1.39 \times 10^{-2a}$	$-2.13 \times 10^{-1} \pm 2.43 \times 10^{-2c}$
Acetate	$6.62 \times 10^{-1} \pm 5.73 \times 10^{-1a}$	$-1.55 \times 10^{-1} \pm 7.07 \times 10^{-2b}$	$1.61 \times 10^{-1} \pm 5.34 \times 10^{-1b}$	$1.99 \times 10^{-1} \pm 4.54 \times 10^{-1ab}$
N6-Acetyllysine	$-4.86 \times 10^{-2} \pm 1.84 \times 10^{-2b}$	$-7.83 \times 10^{-2} \pm 5.49 \times 10^{-2c}$	$-5.23 \times 10^{-3} \pm 5.26 \times 10^{-2b}$	$1.01 \times 10^{-1} \pm 4.07 \times 10^{-2a}$
Alanine	$1.30 \times 10^{-2} \pm 9.93 \times 10^{-2c}$	$1.58 \times 10^{-1} \pm 8.11 \times 10^{-2b}$	$4.72 \times 10^{-1} \pm 2.64 \times 10^{-1a}$	$-3.87 \times 10^{-1} \pm 2.47 \times 10^{-2d}$
Alloisoleucine	$3.91 \times 10^{-1} \pm 1.54 \times 10^{-1bc}$	$7.10 \times 10^{-1} \pm 1.82 \times 10^{-1a}$	$2.46 \times 10^{-1} \pm 1.47 \times 10^{-1c}$	$5.93 \times 10^{-1} \pm 1.18 \times 10^{-1ab}$
Acetoin	$1.67 \times 10^{-1} \pm 8.59 \times 10^{-2ab}$	$5.89 \times 10^{-2} \pm 3.27 \times 10^{-2b}$	$3.13 \times 10^{-1} \pm 2.99 \times 10^{-1a}$	$2.03 \times 10^{-1} \pm 4.45 \times 10^{-2ab}$
Ethanol	$8.29 \times 10^{+1} \pm 2.14 \times 10^{+1a}$	$1.02 \times 10^{+2} \pm 2.08 \times 10^{+1a}$	$4.23 \times 10^{+1} \pm 2.28 \times 10^{+1b}$	$1.17 \times 10^{+2} \pm 7.55 \times 10^{+0a}$
2,3-Butanediol	$2.01 \times 10^{-1} \pm 9.03 \times 10^{-2b}$	$1.76 \times 10^{-1} \pm 3.92 \times 10^{-2b}$	$4.25 \times 10^{-2} \pm 4.03 \times 10^{-2c}$	$6.33 \times 10^{-1} \pm 8.61 \times 10^{-2a}$
Isoleucine	$-3.21 \times 10^{-2} \pm 1.51 \times 10^{-2a}$	$-7.51 \times 10^{-2} \pm 1.46 \times 10^{-2b}$	$-5.09 \times 10^{-2} \pm 1.89 \times 10^{-2a}$	$-1.00 \times 10^{-1} \pm 2.38 \times 10^{-2b}$
Valine	$-2.58 \times 10^{-2} \pm 2.10 \times 10^{-2b}$	$4.18 \times 10^{-2} \pm 4.16 \times 10^{-2a}$	$-1.50 \times 10^{-2} \pm 1.48 \times 10^{-2b}$	$-1.39 \times 10^{-1} \pm 2.95 \times 10^{-2c}$
Leucine	$-7.97 \times 10^{-3} \pm 1.09 \times 10^{-1a}$	$-1.58 \times 10^{-1} \pm 1.24 \times 10^{-1b}$	$-8.72 \times 10^{-2} \pm 8.74 \times 10^{-2ab}$	$-1.40 \times 10^{-1} \pm 2.49 \times 10^{-2ab}$
2-Oxoisocaproate	$2.35 \times 10^{-2} \pm 1.84 \times 10^{-2c}$	$3.89 \times 10^{-2} \pm 3.88 \times 10^{-2bc}$	$1.17 \times 10^{-1} \pm 4.29 \times 10^{-2a}$	$6.85 \times 10^{-2} \pm 1.49 \times 10^{-2ab}$

\* Compact letters display of the comparisons between each pair of groups, where two mean values followed by a common superscript are not significantly different.

**Table S5: Concentration (mmol/L, mean  $\pm$  sd) of intracellular metabolites significantly different in relation to *Candida* species.**

	<i>C. albicans</i> complex	<i>C. glabrata</i>	<i>C. parapsilosis</i>	<i>C. tropicalis</i>
ADP	$2.48 \times 10^{-3} \pm 8.27 \times 10^{-4ab^*}$	$1.81 \times 10^{-3} \pm 5.63 \times 10^{-4b}$	$2.28 \times 10^{-3} \pm 1.02 \times 10^{-3ab}$	$3.82 \times 10^{-3} \pm 6.97 \times 10^{-4a}$
Tyrosine	$9.88 \times 10^{-3} \pm 2.32 \times 10^{-3c}$	$1.33 \times 10^{-2} \pm 1.33 \times 10^{-3b}$	$9.94 \times 10^{-3} \pm 1.96 \times 10^{-3c}$	$2.17 \times 10^{-2} \pm 1.28 \times 10^{-3a}$
Fumarate	$3.65 \times 10^{-3} \pm 5.74 \times 10^{-4b}$	$3.99 \times 10^{-3} \pm 6.99 \times 10^{-4b}$	$3.21 \times 10^{-3} \pm 8.01 \times 10^{-4b}$	$5.17 \times 10^{-3} \pm 7.46 \times 10^{-4a}$
AMP	$1.14 \times 10^{-2} \pm 3.27 \times 10^{-3b}$	$2.00 \times 10^{-2} \pm 3.88 \times 10^{-3a}$	$1.83 \times 10^{-2} \pm 4.19 \times 10^{-3a}$	$1.67 \times 10^{-2} \pm 4.60 \times 10^{-3ab}$
Adenosine	$8.99 \times 10^{-3} \pm 2.30 \times 10^{-3b}$	$1.24 \times 10^{-2} \pm 3.20 \times 10^{-3a}$	$1.11 \times 10^{-2} \pm 2.97 \times 10^{-3ab}$	$8.71 \times 10^{-3} \pm 1.30 \times 10^{-3b}$
NAD	$6.90 \times 10^{-3} \pm 1.33 \times 10^{-3a}$	$4.77 \times 10^{-3} \pm 1.28 \times 10^{-3b}$	$6.07 \times 10^{-3} \pm 1.01 \times 10^{-3ab}$	$6.38 \times 10^{-3} \pm 7.71 \times 10^{-4ab}$
UMP	$9.40 \times 10^{-3} \pm 2.98 \times 10^{-3c}$	$1.03 \times 10^{-2} \pm 1.30 \times 10^{-3bc}$	$1.31 \times 10^{-2} \pm 1.92 \times 10^{-3ab}$	$1.54 \times 10^{-2} \pm 4.79 \times 10^{-3a}$
Glucose-1-phosphate	$3.90 \times 10^{-2} \pm 2.53 \times 10^{-2a}$	$1.19 \times 10^{-2} \pm 5.37 \times 10^{-3b}$	$2.76 \times 10^{-2} \pm 1.53 \times 10^{-2ab}$	$1.66 \times 10^{-2} \pm 1.08 \times 10^{-2ab}$
Sucrose	$1.22 \times 10^{-2} \pm 4.97 \times 10^{-3ab}$	$1.69 \times 10^{-2} \pm 1.29 \times 10^{-2a}$	$6.32 \times 10^{-3} \pm 2.39 \times 10^{-3b}$	$6.57 \times 10^{-3} \pm 6.83 \times 10^{-4ab}$
Threonine	$1.25 \times 10^{-2} \pm 4.20 \times 10^{-3c}$	$3.31 \times 10^{-2} \pm 3.73 \times 10^{-3a}$	$1.86 \times 10^{-2} \pm 6.21 \times 10^{-3b}$	$1.75 \times 10^{-2} \pm 8.26 \times 10^{-3bc}$
Proline	$3.57 \times 10^{-2} \pm 8.86 \times 10^{-3b}$	$6.46 \times 10^{-2} \pm 2.17 \times 10^{-2a}$	$5.56 \times 10^{-2} \pm 1.09 \times 10^{-2a}$	$2.12 \times 10^{-2} \pm 8.44 \times 10^{-3b}$
Lactate	$2.37 \times 10^{-2} \pm 7.34 \times 10^{-3a}$	$1.25 \times 10^{-2} \pm 4.89 \times 10^{-3b}$	$1.83 \times 10^{-2} \pm 6.55 \times 10^{-3ab}$	$2.95 \times 10^{-2} \pm 1.45 \times 10^{-2a}$
Trehalose	$2.89 \times 10^{-2} \pm 2.91 \times 10^{-2b}$	$8.64 \times 10^{-1} \pm 3.91 \times 10^{-1a}$	$5.40 \times 10^{-1} \pm 3.90 \times 10^{-1a}$	$1.53 \times 10^{-2} \pm 4.39 \times 10^{-3b}$
Glycerol	$1.14 \times 10^{+0} \pm 5.04 \times 10^{-1a}$	$6.81 \times 10^{-1} \pm 5.63 \times 10^{-1b}$	$6.31 \times 10^{-1} \pm 4.28 \times 10^{-1ab}$	$3.68 \times 10^{-1} \pm 7.93 \times 10^{-2b}$
Glucose	$5.08 \times 10^{-2} \pm 7.57 \times 10^{-2b}$	$2.05 \times 10^{-1} \pm 1.18 \times 10^{-1a}$	$5.55 \times 10^{-1} \pm 6.75 \times 10^{-1a}$	$1.08 \times 10^{-2} \pm 4.22 \times 10^{-3b}$

O-Phosphocholine	$3.91 \times 10^{-3} \pm 3.42 \times 10^{-3bc}$	$7.92 \times 10^{-3} \pm 2.05 \times 10^{-3a}$	$5.99 \times 10^{-3} \pm 1.64 \times 10^{-3ab}$	$2.41 \times 10^{-3} \pm 1.45 \times 10^{-3c}$
Ornithine	$3.35 \times 10^{-3} \pm 2.46 \times 10^{-3b}$	$8.24 \times 10^{-3} \pm 6.89 \times 10^{-3ab}$	$1.23 \times 10^{-2} \pm 6.90 \times 10^{-3a}$	$9.03 \times 10^{-3} \pm 5.34 \times 10^{-3ab}$
Lysine	$3.50 \times 10^{-2} \pm 1.21 \times 10^{-2c}$	$4.48 \times 10^{-2} \pm 9.29 \times 10^{-3bc}$	$9.28 \times 10^{-2} \pm 6.41 \times 10^{-2a}$	$8.17 \times 10^{-2} \pm 1.22 \times 10^{-2ab}$
Asparagine	$2.26 \times 10^{-2} \pm 6.19 \times 10^{-3b}$	$3.24 \times 10^{-2} \pm 6.98 \times 10^{-3a}$	$2.18 \times 10^{-2} \pm 6.43 \times 10^{-3b}$	$2.49 \times 10^{-2} \pm 2.63 \times 10^{-3ab}$
Aspartate	$3.33 \times 10^{-2} \pm 1.37 \times 10^{-2c}$	$5.78 \times 10^{-2} \pm 1.20 \times 10^{-2b}$	$3.81 \times 10^{-2} \pm 1.23 \times 10^{-2bc}$	$9.78 \times 10^{-2} \pm 2.00 \times 10^{-2a}$
Malate	$4.01 \times 10^{-2} \pm 9.92 \times 10^{-3b}$	$5.43 \times 10^{-2} \pm 1.04 \times 10^{-2a}$	$5.74 \times 10^{-2} \pm 5.15 \times 10^{-3a}$	$7.47 \times 10^{-2} \pm 1.10 \times 10^{-2a}$
Methionine	$9.61 \times 10^{-3} \pm 3.80 \times 10^{-3b}$	$1.44 \times 10^{-2} \pm 4.21 \times 10^{-3a}$	$1.40 \times 10^{-2} \pm 4.94 \times 10^{-3ab}$	$8.15 \times 10^{-3} \pm 1.74 \times 10^{-3b}$
Citrate	$3.34 \times 10^{-2} \pm 4.83 \times 10^{-3b}$	$3.49 \times 10^{-2} \pm 5.66 \times 10^{-3ab}$	$4.13 \times 10^{-2} \pm 7.55 \times 10^{-3a}$	$3.75 \times 10^{-2} \pm 1.21 \times 10^{-3ab}$
Glutamine	$3.73 \times 10^{-2} \pm 1.82 \times 10^{-2b}$	$1.22 \times 10^{-1} \pm 4.35 \times 10^{-2a}$	$5.86 \times 10^{-2} \pm 3.95 \times 10^{-2b}$	$5.11 \times 10^{-2} \pm 1.12 \times 10^{-2b}$
2-Oxoglutarate	$4.01 \times 10^{-3} \pm 8.68 \times 10^{-4b}$	$7.64 \times 10^{-3} \pm 3.90 \times 10^{-3a}$	$3.94 \times 10^{-3} \pm 8.90 \times 10^{-4b}$	$3.32 \times 10^{-3} \pm 5.81 \times 10^{-4b}$
Pyroglutamate	$8.13 \times 10^{-3} \pm 1.40 \times 10^{-3a}$	$7.72 \times 10^{-3} \pm 2.31 \times 10^{-3a}$	$7.24 \times 10^{-3} \pm 3.80 \times 10^{-3ab}$	$4.78 \times 10^{-3} \pm 1.76 \times 10^{-3b}$
Succinate	$1.86 \times 10^{-2} \pm 5.03 \times 10^{-3a}$	$1.33 \times 10^{-2} \pm 2.12 \times 10^{-3b}$	$8.99 \times 10^{-3} \pm 2.59 \times 10^{-3c}$	$1.72 \times 10^{-2} \pm 5.41 \times 10^{-3ab}$
Pyruvate	$2.52 \times 10^{-2} \pm 1.05 \times 10^{-2a}$	$3.06 \times 10^{-2} \pm 1.16 \times 10^{-2a}$	$7.97 \times 10^{-3} \pm 2.20 \times 10^{-3b}$	$6.92 \times 10^{-3} \pm 4.06 \times 10^{-3b}$
Glutamate	$6.61 \times 10^{-2} \pm 3.53 \times 10^{-2b}$	$2.60 \times 10^{-1} \pm 5.45 \times 10^{-2a}$	$1.76 \times 10^{-1} \pm 5.36 \times 10^{-2a}$	$1.90 \times 10^{-1} \pm 5.29 \times 10^{-2a}$
Acetone	$1.67 \times 10^{-2} \pm 8.48 \times 10^{-3a}$	$5.07 \times 10^{-3} \pm 4.43 \times 10^{-3b}$	$5.19 \times 10^{-3} \pm 4.08 \times 10^{-3b}$	$1.74 \times 10^{-2} \pm 1.06 \times 10^{-2a}$
Acetate	$1.04 \times 10^{+0} \pm 4.77 \times 10^{-1a}$	$4.03 \times 10^{-1} \pm 1.78 \times 10^{-1b}$	$2.53 \times 10^{-1} \pm 1.30 \times 10^{-1b}$	$2.72 \times 10^{-1} \pm 1.42 \times 10^{-1b}$
3-Methyl-2-oxovalerate	$5.47 \times 10^{-2} \pm 1.24 \times 10^{-2b}$	$7.57 \times 10^{-2} \pm 7.22 \times 10^{-3a}$	$7.82 \times 10^{-2} \pm 1.92 \times 10^{-2a}$	$7.11 \times 10^{-2} \pm 1.05 \times 10^{-2ab}$
Alanine	$1.30 \times 10^{-1} \pm 5.37 \times 10^{-2b}$	$1.78 \times 10^{-1} \pm 5.95 \times 10^{-2ab}$	$2.67 \times 10^{-1} \pm 1.06 \times 10^{-1a}$	$1.34 \times 10^{-1} \pm 1.68 \times 10^{-2ab}$
Acetoin	$1.20 \times 10^{-2} \pm 3.52 \times 10^{-3a}$	$4.39 \times 10^{-3} \pm 1.50 \times 10^{-3b}$	$8.74 \times 10^{-3} \pm 4.87 \times 10^{-3a}$	$9.61 \times 10^{-3} \pm 1.81 \times 10^{-3a}$
Ethanol	$3.29 \times 10^{+0} \pm 1.16 \times 10^{+0a}$	$1.80 \times 10^{+0} \pm 6.43 \times 10^{-1b}$	$1.53 \times 10^{+0} \pm 4.66 \times 10^{-1b}$	$3.06 \times 10^{+0} \pm 1.75 \times 10^{+0ab}$
2,3-Butanediol	$9.67 \times 10^{-3} \pm 2.42 \times 10^{-3a}$	$3.52 \times 10^{-3} \pm 1.13 \times 10^{-3b}$	$4.83 \times 10^{-3} \pm 2.73 \times 10^{-3b}$	$1.13 \times 10^{-2} \pm 4.00 \times 10^{-3a}$
Propionate	$1.33 \times 10^{-1} \pm 2.72 \times 10^{-2a}$	$6.50 \times 10^{-2} \pm 3.23 \times 10^{-2b}$	$6.40 \times 10^{-2} \pm 2.91 \times 10^{-2b}$	$7.52 \times 10^{-2} \pm 5.28 \times 10^{-3b}$
Isoleucine	$1.18 \times 10^{-2} \pm 2.52 \times 10^{-3b}$	$1.59 \times 10^{-2} \pm 2.28 \times 10^{-3a}$	$1.44 \times 10^{-2} \pm 5.11 \times 10^{-3ab}$	$1.76 \times 10^{-2} \pm 3.20 \times 10^{-3a}$
Valine	$2.17 \times 10^{-2} \pm 4.01 \times 10^{-3b}$	$3.87 \times 10^{-2} \pm 7.38 \times 10^{-3a}$	$3.47 \times 10^{-2} \pm 6.72 \times 10^{-3a}$	$3.82 \times 10^{-2} \pm 7.81 \times 10^{-3a}$
2-Aminobutyrate	$4.77 \times 10^{-3} \pm 1.02 \times 10^{-3b}$	$4.21 \times 10^{-3} \pm 6.90 \times 10^{-4b}$	$7.23 \times 10^{-3} \pm 2.05 \times 10^{-3a}$	$4.70 \times 10^{-3} \pm 6.60 \times 10^{-4b}$
Leucine	$6.52 \times 10^{-2} \pm 1.78 \times 10^{-2b}$	$9.43 \times 10^{-2} \pm 1.52 \times 10^{-2a}$	$8.98 \times 10^{-2} \pm 3.67 \times 10^{-2ab}$	$7.40 \times 10^{-2} \pm 1.40 \times 10^{-2ab}$

\* Compact letters display of the comparisons between each pair of groups, where two mean values followed by a common superscript are not significantly different.

**Table S6: Concentration (mmol/L, mean  $\pm$  sd) of extracellular metabolites significantly different between *C. albicans* sub-groups expressed as difference from growth medium.**

	subgroup-1	subgroup-2	p-value
Tryptophan	$-2.91 \times 10^{-3} \pm 1.05 \times 10^{-2}$	$-3.86 \times 10^{-2} \pm 3.84 \times 10^{-2}$	$1.14 \times 10^{-3}$
Cytidine	$-2.40 \times 10^{-3} \pm 1.09 \times 10^{-3}$	$-7.92 \times 10^{-4} \pm 1.55 \times 10^{-3}$	$4.96 \times 10^{-2}$
Guanosine	$-2.30 \times 10^{-3} \pm 9.15 \times 10^{-5}$	$-1.57 \times 10^{-3} \pm 1.22 \times 10^{-3}$	$6.92 \times 10^{-3}$
Hydroxyacetone	$2.53 \times 10^{-3} \pm 6.79 \times 10^{-4}$	$4.54 \times 10^{-3} \pm 2.23 \times 10^{-3}$	$2.36 \times 10^{-3}$
Arabinitol	$1.02 \pm 0.68$	$2.02 \pm 0.11$	$5.00 \times 10^{-2}$
Sarcosine	$4.67 \times 10^{-3} \pm 1.40 \times 10^{-3}$	$5.65 \times 10^{-4} \pm 3.71 \times 10^{-3}$	$1.81 \times 10^{-3}$
Malate	$-3.64 \times 10^{-2} \pm 7.50 \times 10^{-3}$	$-1.32 \times 10^{-2} \pm 2.63 \times 10^{-2}$	$2.10 \times 10^{-3}$
2-Oxoglutarate	$5.58 \times 10^{-2} \pm 3.15 \times 10^{-2}$	$1.17 \times 10^{-1} \pm 7.27 \times 10^{-2}$	$1.81 \times 10^{-2}$
Acetone	$-4.58 \times 10^{-3} \pm 9.10 \times 10^{-4}$	$-3.04 \times 10^{-3} \pm 2.55 \times 10^{-3}$	$4.26 \times 10^{-2}$
Methionine	$-3.78 \times 10^{-2} \pm 6.24 \times 10^{-3}$	$-6.76 \times 10^{-2} \pm 3.94 \times 10^{-2}$	$1.58 \times 10^{-3}$
Acetate	$1.72 \times 10^{-1} \pm 3.14 \times 10^{-1}$	$7.67 \times 10^{-1} \pm 5.60 \times 10^{-1}$	$1.91 \times 10^{-2}$
Alanine	$9.55 \times 10^{-2} \pm 2.50 \times 10^{-2}$	$-2.68 \times 10^{-4} \pm 1.03 \times 10^{-1}$	$6.45 \times 10^{-4}$
Acetoin	$9.37 \times 10^{-2} \pm 3.54 \times 10^{-2}$	$1.80 \times 10^{-1} \pm 8.73 \times 10^{-2}$	$5.61 \times 10^{-3}$
Leucine	$9.33 \times 10^{-2} \pm 3.18 \times 10^{-2}$	$-2.83 \times 10^{-2} \pm 1.08 \times 10^{-1}$	$2.92 \times 10^{-4}$

**Table S7: Concentration (mmol/L, mean  $\pm$  sd) of intracellular metabolites significantly different between *C. albicans* sub-groups**

	subgroup-1	subgroup-2	p-value
Fumarate	$3.12 \times 10^{-3} \pm 1.64 \times 10^{-4}$	$3.67 \times 10^{-3} \pm 4.79 \times 10^{-4}$	$7.49 \times 10^{-4}$
Trehalose	$1.37 \times 10^{-2} \pm 2.47 \times 10^{-3}$	$2.96 \times 10^{-2} \pm 3.00 \times 10^{-2}$	$1.55 \times 10^{-2}$
Glycerol	$1.66 \pm 0.18$	$1.06 \pm 0.50$	$8.21 \times 10^{-4}$
Glucose	$6.30 \times 10^{-3} \pm 5.88 \times 10^{-3}$	$5.97 \times 10^{-2} \pm 8.02 \times 10^{-2}$	$3.06 \times 10^{-3}$
O-Phosphocholine	$1.98 \times 10^{-3} \pm 3.64 \times 10^{-4}$	$4.12 \times 10^{-3} \pm 3.63 \times 10^{-3}$	$8.29 \times 10^{-3}$
Glutamine	$2.05 \times 10^{-2} \pm 1.59 \times 10^{-3}$	$3.94 \times 10^{-2} \pm 1.84 \times 10^{-2}$	$3.39 \times 10^{-5}$
Pyroglutamate	$6.82 \times 10^{-3} \pm 8.06 \times 10^{-4}$	$8.39 \times 10^{-3} \pm 1.37 \times 10^{-3}$	$1.68 \times 10^{-2}$
4-Aminobutyrate	$5.15 \times 10^{-3} \pm 1.53 \times 10^{-4}$	$6.66 \times 10^{-3} \pm 1.83 \times 10^{-3}$	$4.35 \times 10^{-4}$
Ethanol	$4.59 \pm 0.28$	$3.05 \pm 1.12$	$1.06 \times 10^{-5}$
2-Aminobutyrate	$4.06 \times 10^{-3} \pm 4.48 \times 10^{-4}$	$4.89 \times 10^{-3} \pm 1.06 \times 10^{-3}$	$2.35 \times 10^{-2}$

**Table S8. Mean concentration in mmol/L (sd) of extracellular metabolites significantly different between *Candida* biofilm categories.**

	0	1	2	3	p-value
2-Oxoisocaproate	$2.03 \times 10^{-2}$ ( $1.83 \times 10^{-2}$ )	$3.53 \times 10^{-2}$ ( $2.27 \times 10^{-2}$ )	$2.43 \times 10^{-2}$ ( $6.60 \times 10^{-2}$ )	$6.82 \times 10^{-2}$ ( $1.29 \times 10^{-2}$ )	$1.08 \times 10^{-4}$
Orotate	$1.59 \times 10^{-3}$ ( $8.43 \times 10^{-4}$ )	$1.59 \times 10^{-3}$ ( $5.25 \times 10^{-4}$ )	$1.18 \times 10^{-3}$ ( $9.32 \times 10^{-4}$ )	$5.43 \times 10^{-4}$ ( $1.88 \times 10^{-4}$ )	$1.86 \times 10^{-3}$
Inosine	$2.14 \times 10^{-3}$ ( $5.44 \times 10^{-3}$ )	$1.13 \times 10^{-3}$ ( $2.43 \times 10^{-3}$ )	$-3.53 \times 10^{-4}$ ( $1.29 \times 10^{-3}$ )	$-1.15 \times 10^{-3}$ ( $6.98 \times 10^{-4}$ )	$7.99 \times 10^{-3}$
Choline	$-2.00 \times 10^{-2}$ ( $1.15 \times 10^{-2}$ )	$-2.02 \times 10^{-2}$ ( $1.71 \times 10^{-2}$ )	$-2.50 \times 10^{-2}$ ( $1.32 \times 10^{-2}$ )	$-2.58 \times 10^{-2}$ ( $1.35 \times 10^{-3}$ )	$1.20 \times 10^{-2}$
Lysine	$1.22 \times 10^{-1}$ ( $5.35 \times 10^{-2}$ )	$1.23 \times 10^{-1}$ ( $5.67 \times 10^{-2}$ )	$7.11 \times 10^{-2}$ ( $6.31 \times 10^{-2}$ )	$8.07 \times 10^{-2}$ ( $4.74 \times 10^{-2}$ )	$4.56 \times 10^{-2}$

0: no biofilm; 1: weak producers; 2 intermediate producers; 3 strong producers

**Table S9. Mean concentration in mmol/L (sd) of intracellular metabolites significantly different between *Candida* biofilm categories.**

	0	1	2	3	p-value
Ornithine	$2.97 \times 10^{-3}$ ( $2.35 \times 10^{-3}$ )	$4.00 \times 10^{-3}$ ( $4.84 \times 10^{-3}$ )	$4.37 \times 10^{-3}$ ( $1.83 \times 10^{-3}$ )	$1.00 \times 10^{-2}$ ( $1.82 \times 10^{-3}$ )	$2.49 \times 10^{-4}$
Malate	$3.68 \times 10^{-2}$ ( $2.15 \times 10^{-2}$ )	$4.89 \times 10^{-2}$ ( $2.05 \times 10^{-2}$ )	$4.59 \times 10^{-2}$ ( $2.18 \times 10^{-2}$ )	$6.06 \times 10^{-2}$ ( $1.27 \times 10^{-2}$ )	$4.80 \times 10^{-4}$
2-Oxoglutarate	$4.62 \times 10^{-3}$ ( $1.21 \times 10^{-3}$ )	$4.25 \times 10^{-3}$ ( $9.50 \times 10^{-4}$ )	$4.25 \times 10^{-3}$ ( $1.39 \times 10^{-3}$ )	$3.45 \times 10^{-3}$ ( $3.28 \times 10^{-4}$ )	$2.61 \times 10^{-3}$
Pyruvate	$3.11 \times 10^{-2}$ ( $1.20 \times 10^{-2}$ )	$2.41 \times 10^{-2}$ ( $1.23 \times 10^{-2}$ )	$1.65 \times 10^{-2}$ ( $1.43 \times 10^{-2}$ )	$9.46 \times 10^{-3}$ ( $5.61 \times 10^{-3}$ )	$7.30 \times 10^{-3}$
UMP	$8.04 \times 10^{-3}$ ( $2.50 \times 10^{-3}$ )	$1.07 \times 10^{-2}$ ( $3.03 \times 10^{-3}$ )	$1.13 \times 10^{-2}$ ( $1.30 \times 10^{-3}$ )	$1.52 \times 10^{-2}$ ( $2.05 \times 10^{-3}$ )	$1.67 \times 10^{-2}$
Glutamate	$4.72 \times 10^{-2}$ ( $1.88 \times 10^{-1}$ )	$9.63 \times 10^{-2}$ ( $1.49 \times 10^{-1}$ )	$9.72 \times 10^{-2}$ ( $1.06 \times 10^{-1}$ )	$1.50 \times 10^{-1}$ ( $3.15 \times 10^{-2}$ )	$3.07 \times 10^{-2}$
AMP	$1.16 \times 10^{-2}$ ( $6.68 \times 10^{-3}$ )	$1.41 \times 10^{-2}$ ( $9.47 \times 10^{-3}$ )	$1.41 \times 10^{-2}$ ( $3.90 \times 10^{-3}$ )	$1.93 \times 10^{-2}$ ( $5.38 \times 10^{-3}$ )	$4.20 \times 10^{-2}$
Lysine	$2.97 \times 10^{-2}$ ( $2.33 \times 10^{-2}$ )	$4.12 \times 10^{-2}$ ( $1.94 \times 10^{-2}$ )	$4.56 \times 10^{-2}$ ( $2.14 \times 10^{-2}$ )	$5.96 \times 10^{-2}$ ( $2.65 \times 10^{-2}$ )	$4.56 \times 10^{-2}$
Glycerol	$1.28$ ( $1.19$ )	$1.23$ ( $8.47 \times 10^{-1}$ )	$7.48 \times 10^{-1}$ ( $6.05 \times 10^{-1}$ )	$4.24 \times 10^{-1}$ ( $1.69 \times 10^{-1}$ )	$4.88 \times 10^{-2}$

0: no biofilm; 1: weak producers; 2 intermediate producers; 3 strong producers

**Table S10. Mean concentration in mmol/L (sd) of extracellular metabolites significantly different between fluconazole-resistant (R) and susceptible (S) *Candida* strains.**

	R	S	p-value
Isoleucine	-7.33x10 <sup>-02</sup> (2.29x10 <sup>-02</sup> )	-3.67x10 <sup>-02</sup> (1.67x10 <sup>-02</sup> )	5.18x10 <sup>-06</sup>
Sarcosine	-7.54x10 <sup>-03</sup> (8.74x10 <sup>-03</sup> )	1.67x10 <sup>-03</sup> (4.31x10 <sup>-03</sup> )	2.60x10 <sup>-05</sup>
Inosine	3.31x10 <sup>-03</sup> (5.23x10 <sup>-03</sup> )	1.54x10 <sup>-05</sup> (1.96x10 <sup>-03</sup> )	2.58x10 <sup>-04</sup>
Asparagine	-1.47x10 <sup>-01</sup> (6.30x10 <sup>-02</sup> )	-1.73x10 <sup>-01</sup> (1.35x10 <sup>-02</sup> )	1.76x10 <sup>-03</sup>
Acetate	-1.27x10 <sup>-01</sup> (4.68x10 <sup>-01</sup> )	5.09x10 <sup>-01</sup> (9.90x10 <sup>-01</sup> )	2.22x10 <sup>-03</sup>
Fumarate	1.29x10 <sup>-02</sup> (8.68x10 <sup>-03</sup> )	2.64x10 <sup>-02</sup> (2.12x10 <sup>-02</sup> )	2.79x10 <sup>-03</sup>
Arabinitol	-6.87x10 <sup>-03</sup> (1.95)	1.63 (1.35)	2.93x10 <sup>-03</sup>
Leucine	-1.35x10 <sup>-01</sup> (1.26x10 <sup>-01</sup> )	8.69x10 <sup>-03</sup> (1.66x10 <sup>-01</sup> )	3.01x10 <sup>-03</sup>
Alloisoleucine	6.31x10 <sup>-01</sup> (2.77x10 <sup>-01</sup> )	3.73x10 <sup>-01</sup> (1.80x10 <sup>-01</sup> )	3.91x10 <sup>-03</sup>
Choline	-8.94x10 <sup>-03</sup> (5.37x10 <sup>-02</sup> )	-2.37x10 <sup>-02</sup> (9.53x10 <sup>-03</sup> )	3.96x10 <sup>-03</sup>
Guanosine	1.90x10 <sup>-03</sup> (5.19x10 <sup>-03</sup> )	-2.05x10 <sup>-03</sup> (2.53x10 <sup>-03</sup> )	5.30x10 <sup>-03</sup>
Methionine	-1.19x10 <sup>-01</sup> (5.57x10 <sup>-02</sup> )	-5.65x10 <sup>-02</sup> (5.82x10 <sup>-02</sup> )	5.75x10 <sup>-03</sup>
Phenylalanine	1.27x10 <sup>-02</sup> (4.30x10 <sup>-02</sup> )	6.18x10 <sup>-02</sup> (4.42x10 <sup>-02</sup> )	7.53x10 <sup>-03</sup>
Cytidine	2.21x10 <sup>-03</sup> (6.43x10 <sup>-03</sup> )	-8.24x10 <sup>-04</sup> (2.92x10 <sup>-03</sup> )	8.18x10 <sup>-03</sup>
Succinate	5.29x10 <sup>-01</sup> (2.10x10 <sup>-01</sup> )	3.40x10 <sup>-01</sup> (2.65x10 <sup>-01</sup> )	1.01x10 <sup>-02</sup>
Acetoin	7.77x10 <sup>-02</sup> (1.10x10 <sup>-01</sup> )	1.86x10 <sup>-01</sup> (1.44x10 <sup>-01</sup> )	1.02x10 <sup>-02</sup>
Formate	-1.81x10 <sup>-02</sup> (2.68x10 <sup>-02</sup> )	1.22x10 <sup>-02</sup> (4.77x10 <sup>-02</sup> )	1.06x10 <sup>-02</sup>
Malate	1.14x10 <sup>-02</sup> (6.26x10 <sup>-02</sup> )	-2.76x10 <sup>-02</sup> (3.22x10 <sup>-02</sup> )	1.70x10 <sup>-02</sup>
3-Methyl-2-oxovalerate	4.70x10 <sup>-02</sup> (1.60x10 <sup>-02</sup> )	3.15x10 <sup>-02</sup> (1.37x10 <sup>-02</sup> )	2.76x10 <sup>-02</sup>
N6-Acetyllysine	-8.36x10 <sup>-02</sup> (4.77x10 <sup>-02</sup> )	-4.29x10 <sup>-02</sup> (3.43x10 <sup>-02</sup> )	2.99x10 <sup>-02</sup>
Glucose	-3.89x10 <sup>+01</sup> (1.10x10 <sup>+01</sup> )	-3.15x10 <sup>+01</sup> (1.01x10 <sup>+01</sup> )	3.86x10 <sup>-02</sup>
Ethanol	1.02x10 <sup>+02</sup> (1.88x10 <sup>+01</sup> )	8.32x10 <sup>+01</sup> (2.94x10 <sup>+01</sup> )	4.87x10 <sup>-02</sup>

**Table S11. Mean concentration in mmol/L (sd) of intracellular metabolites significantly different between fluconazole-resistant (R) and susceptible (S) *Candida* strains.**

	R	S	p-value
Glutamate	2.18x10 <sup>-01</sup> (1.22x10 <sup>-01</sup> )	6.38x10 <sup>-02</sup> (6.77x10 <sup>-02</sup> )	1.05x10 <sup>-05</sup>
Glutamine	9.97x10 <sup>-02</sup> (7.09x10 <sup>-02</sup> )	3.27x10 <sup>-02</sup> (1.94x10 <sup>-02</sup> )	1.92x10 <sup>-05</sup>
Threonine	2.77x10 <sup>-02</sup> (1.65x10 <sup>-02</sup> )	1.33x10 <sup>-02</sup> (4.19x10 <sup>-03</sup> )	5.60x10 <sup>-05</sup>
Acetone	4.00x10 <sup>-03</sup> (4.28x10 <sup>-03</sup> )	1.52x10 <sup>-02</sup> (1.28x10 <sup>-02</sup> )	1.71x10 <sup>-04</sup>
Acetoin	5.92x10 <sup>-03</sup> (3.41x10 <sup>-03</sup> )	1.17x10 <sup>-02</sup> (5.37x10 <sup>-03</sup> )	2.49x10 <sup>-04</sup>
AMP	1.92x10 <sup>-02</sup> (6.30x10 <sup>-03</sup> )	1.24x10 <sup>-02</sup> (5.93x10 <sup>-03</sup> )	2.97x10 <sup>-04</sup>
Asparagine	3.13x10 <sup>-02</sup> (1.25x10 <sup>-02</sup> )	2.17x10 <sup>-02</sup> (6.55x10 <sup>-03</sup> )	4.84x10 <sup>-04</sup>
Aspartate	5.81x10 <sup>-02</sup> (1.37x10 <sup>-02</sup> )	2.95x10 <sup>-02</sup> (1.80x10 <sup>-02</sup> )	9.38x10 <sup>-04</sup>
Adenosine	1.21x10 <sup>-02</sup> (4.58x10 <sup>-03</sup> )	8.29x10 <sup>-03</sup> (3.13x10 <sup>-03</sup> )	1.60x10 <sup>-03</sup>
Tyrosine	1.27x10 <sup>-02</sup> (2.60x10 <sup>-03</sup> )	9.83x10 <sup>-03</sup> (3.96x10 <sup>-03</sup> )	1.69x10 <sup>-03</sup>
Propionate	6.93x10 <sup>-02</sup> (7.67x10 <sup>-02</sup> )	1.26x10 <sup>-01</sup> (5.11x10 <sup>-02</sup> )	1.76x10 <sup>-03</sup>
Trehalose	6.95x10 <sup>-01</sup> (8.09x10 <sup>-01</sup> )	2.03x10 <sup>-02</sup> (5.63x10 <sup>-02</sup> )	2.19x10 <sup>-03</sup>
2,3-Butanediol	4.57x10 <sup>-03</sup> (4.02x10 <sup>-03</sup> )	9.53x10 <sup>-03</sup> (2.57x10 <sup>-03</sup> )	2.60x10 <sup>-03</sup>
2-Oxoglutarate	4.96x10 <sup>-03</sup> (2.18x10 <sup>-03</sup> )	3.95x10 <sup>-03</sup> (1.16x10 <sup>-03</sup> )	2.95x10 <sup>-03</sup>
O-Phosphocholine	6.90x10 <sup>-03</sup> (4.13x10 <sup>-03</sup> )	2.61x10 <sup>-03</sup> (3.02x10 <sup>-03</sup> )	4.51x10 <sup>-03</sup>
Glycerol	4.07x10 <sup>-01</sup> (4.28x10 <sup>-01</sup> )	1.23x10 <sup>+00</sup> (8.20x10 <sup>-01</sup> )	4.82x10 <sup>-03</sup>
Valine	3.42x10 <sup>-02</sup> (1.72x10 <sup>-02</sup> )	2.32x10 <sup>-02</sup> (6.95x10 <sup>-03</sup> )	5.36x10 <sup>-03</sup>
Ethanol	2.07 (1.08)	3.17 (1.90)	8.11x10 <sup>-03</sup>
Ornithine	4.96x10 <sup>-03</sup> (1.14x10 <sup>-02</sup> )	3.68x10 <sup>-03</sup> (2.89x10 <sup>-03</sup> )	3.29x10 <sup>-02</sup>
Malate	5.37x10 <sup>-02</sup> (1.23x10 <sup>-02</sup> )	4.25x10 <sup>-02</sup> (1.84x10 <sup>-02</sup> )	3.38x10 <sup>-02</sup>
Proline	4.56x10 <sup>-02</sup> (3.24x10 <sup>-02</sup> )	3.75x10 <sup>-02</sup> (6.10x10 <sup>-03</sup> )	3.39x10 <sup>-02</sup>
Glucose-1-phosphate	1.48x10 <sup>-02</sup> (1.93x10 <sup>-02</sup> )	2.84x10 <sup>-02</sup> (3.48x10 <sup>-02</sup> )	4.21x10 <sup>-02</sup>
Isoleucine	1.49x10 <sup>-02</sup> (5.90x10 <sup>-03</sup> )	1.22x10 <sup>-02</sup> (3.80x10 <sup>-03</sup> )	4.83x10 <sup>-02</sup>
3-Methyl-2-oxovalerate	7.20x10 <sup>-02</sup> (1.46x10 <sup>-02</sup> )	6.19x10 <sup>-02</sup> (2.34x10 <sup>-02</sup> )	4.92x10 <sup>-02</sup>

**Table S12. Mean concentration in mmol/L (sd) of extracellular metabolites significantly different between caspofungin-resistant (R) and susceptible (S) *Candida* strains.**

	R	S	p-value
Putrescine	5.35x10 <sup>-03</sup> (4.37x10 <sup>-03</sup> )	-3.16x10 <sup>-03</sup> (9.73x10 <sup>-03</sup> )	3.06x10 <sup>-05</sup>
Pyruvate	1.28 (1.04)	6.02 (4.36)	1.25x10 <sup>-04</sup>
Glucose	-24.4 (10.5)	-35.6 (15.9)	1.48x10 <sup>-04</sup>
Ribose	-4.47x10 <sup>-02</sup> (2.25x10 <sup>-02</sup> )	-7.22x10 <sup>-02</sup> (3.60x10 <sup>-02</sup> )	3.24x10 <sup>-04</sup>
Methionine	-2.65x10 <sup>-02</sup> (2.52x10 <sup>-02</sup> )	-8.71x10 <sup>-02</sup> (7.88x10 <sup>-02</sup> )	3.32x10 <sup>-04</sup>
Choline	-3.00x10 <sup>-02</sup> (1.50x10 <sup>-03</sup> )	-1.94x10 <sup>-02</sup> (1.16x10 <sup>-02</sup> )	3.68x10 <sup>-04</sup>
Mannose	6.57x10 <sup>-02</sup> (3.66x10 <sup>-02</sup> )	1.33x10 <sup>-02</sup> (2.28x10 <sup>-02</sup> )	3.89x10 <sup>-03</sup>
2-Oxoisocaproate	1.13x10 <sup>-01</sup> (5.56x10 <sup>-02</sup> )	2.47x10 <sup>-02</sup> (3.09x10 <sup>-02</sup> )	5.69x10 <sup>-03</sup>
Arabinitol	3.00 (1.80)	1.25 (1.83)	7.57x10 <sup>-03</sup>
Methanol	-9.72x10 <sup>-03</sup> (1.87x10 <sup>-03</sup> )	-4.22x10 <sup>-03</sup> (4.64x10 <sup>-03</sup> )	8.05x10 <sup>-03</sup>
2,3-Butanediol	5.97x10 <sup>-02</sup> (6.61x10 <sup>-02</sup> )	2.27x10 <sup>-01</sup> (1.14x10 <sup>-01</sup> )	9.36x10 <sup>-03</sup>
Alanine	5.01x10 <sup>-01</sup> (3.34x10 <sup>-01</sup> )	6.74x10 <sup>-02</sup> (1.42x10 <sup>-01</sup> )	1.06x10 <sup>-02</sup>
p-cresol	6.61x10 <sup>-03</sup> (2.47x10 <sup>-03</sup> )	3.27x10 <sup>-03</sup> (3.58x10 <sup>-03</sup> )	1.07x10 <sup>-02</sup>
Succinate	9.85x10 <sup>-02</sup> (3.94x10 <sup>-02</sup> )	4.54x10 <sup>-01</sup> (2.34x10 <sup>-01</sup> )	1.40x10 <sup>-02</sup>
Ethanol	53.3 (31.8)	9.24x10 <sup>+01</sup> (26.7)	2.18x10 <sup>-02</sup>
Sarcosine	7.20x10 <sup>-04</sup> (2.37x10 <sup>-03</sup> )	-9.87x10 <sup>-04</sup> (8.82x10 <sup>-03</sup> )	2.65x10 <sup>-02</sup>
Hydroxyacetone	1.14x10 <sup>-03</sup> (1.13x10 <sup>-03</sup> )	4.46x10 <sup>-03</sup> (3.91x10 <sup>-03</sup> )	3.66x10 <sup>-02</sup>
Phenylalanine	-3.35x10 <sup>-02</sup> (5.90x10 <sup>-02</sup> )	5.37x10 <sup>-02</sup> (4.73x10 <sup>-02</sup> )	4.21x10 <sup>-02</sup>
Glycerol	1.58 (4.90x10 <sup>-01</sup> )	2.43x10 <sup>+00</sup> (1.19)	4.46x10 <sup>-02</sup>

**Table S13. Mean concentration in mmol/L (sd) of intracellular metabolites significantly different between caspofungin-resistant (R) and susceptible (S) *Candida* strains.**

	R	S	p-value
Pyruvate	9.53x10 <sup>-03</sup> (2.65x10 <sup>-03</sup> )	2.44x10 <sup>-02</sup> (1.62x10 <sup>-02</sup> )	8.68x10 <sup>-06</sup>
Glutamate	1.74x10 <sup>-01</sup> (5.95x10 <sup>-02</sup> )	7.36x10 <sup>-02</sup> (1.36x10 <sup>-01</sup> )	3.58x10 <sup>-05</sup>
Malate	5.71x10 <sup>-02</sup> (6.18x10 <sup>-03</sup> )	4.53x10 <sup>-02</sup> (1.85x10 <sup>-02</sup> )	1.25x10 <sup>-04</sup>
Acetate	2.88x10 <sup>-01</sup> (1.79x10 <sup>-01</sup> )	8.32x10 <sup>-01</sup> (7.85x10 <sup>-01</sup> )	5.75x10 <sup>-04</sup>
UMP	1.46x10 <sup>-02</sup> (2.35x10 <sup>-03</sup> )	1.05x10 <sup>-02</sup> (3.87x10 <sup>-03</sup> )	6.29x10 <sup>-04</sup>
Ornithine	1.09x10 <sup>-02</sup> (5.37x10 <sup>-03</sup> )	3.48x10 <sup>-03</sup> (2.57x10 <sup>-03</sup> )	1.08x10 <sup>-03</sup>
Alanine	2.33x10 <sup>-01</sup> (6.20x10 <sup>-02</sup> )	1.28x10 <sup>-01</sup> (7.09x10 <sup>-02</sup> )	2.83x10 <sup>-03</sup>
Sucrose	6.44x10 <sup>-03</sup> (3.21x10 <sup>-03</sup> )	1.18x10 <sup>-02</sup> (7.59x10 <sup>-03</sup> )	3.18x10 <sup>-03</sup>
AMP	1.90x10 <sup>-02</sup> (4.65x10 <sup>-03</sup> )	1.32x10 <sup>-02</sup> (7.15x10 <sup>-03</sup> )	4.32x10 <sup>-03</sup>
Trehalose	3.59x10 <sup>-01</sup> (4.60x10 <sup>-01</sup> )	2.07x10 <sup>-02</sup> (9.43x10 <sup>-02</sup> )	9.77x10 <sup>-03</sup>
O-Phosphocholine	5.96x10 <sup>-03</sup> (2.30x10 <sup>-03</sup> )	3.05x10 <sup>-03</sup> (4.74x10 <sup>-03</sup> )	1.12x10 <sup>-02</sup>
3-Methyl-2-oxovalerate	6.91x10 <sup>-02</sup> (1.20x10 <sup>-02</sup> )	6.35x10 <sup>-02</sup> (2.52x10 <sup>-02</sup> )	3.05x10 <sup>-02</sup>
Acetone	4.02x10 <sup>-03</sup> (4.55x10 <sup>-03</sup> )	1.40x10 <sup>-02</sup> (1.58x10 <sup>-02</sup> )	3.42x10 <sup>-02</sup>
Uracil	5.84x10 <sup>-03</sup> (1.55x10 <sup>-03</sup> )	7.12x10 <sup>-03</sup> (1.92x10 <sup>-03</sup> )	4.31x10 <sup>-02</sup>
Phenylalanine	1.76x10 <sup>-02</sup> (2.38x10 <sup>-03</sup> )	2.09x10 <sup>-02</sup> (5.70x10 <sup>-03</sup> )	4.48x10 <sup>-02</sup>
Succinate	8.13x10 <sup>-03</sup> (4.60x10 <sup>-03</sup> )	1.67x10 <sup>-02</sup> (7.65x10 <sup>-03</sup> )	4.76x10 <sup>-02</sup>



**Table S14. Mean concentration in mmol/L (sd) of extracellular metabolites significantly different between SAP producers (P) and non-producers (N).**

	N	P	p-value
Arabinitol	9.18x10 <sup>-01</sup> (1.63x10 <sup>+00</sup> )	1.94x10 <sup>+00</sup> (1.26x10 <sup>+00</sup> )	1.69x10 <sup>-04</sup>
Valine	-1.12x10 <sup>-02</sup> (4.78x10 <sup>-02</sup> )	-3.11x10 <sup>-02</sup> (2.81x10 <sup>-02</sup> )	8.75x10 <sup>-03</sup>
Inosine	1.14x10 <sup>-03</sup> (4.15x10 <sup>-03</sup> )	-4.61x10 <sup>-05</sup> (2.47x10 <sup>-03</sup> )	1.10x10 <sup>-02</sup>
Malate	-3.67x10 <sup>-03</sup> (5.13x10 <sup>-02</sup> )	-2.90x10 <sup>-02</sup> (3.02x10 <sup>-02</sup> )	1.25x10 <sup>-02</sup>
Choline	-1.80x10 <sup>-02</sup> (1.96x10 <sup>-02</sup> )	-2.45x10 <sup>-02</sup> (8.68x10 <sup>-03</sup> )	1.60x10 <sup>-02</sup>
Sucrose	1.89x10 <sup>-02</sup> (8.65x10 <sup>-03</sup> )	1.34x10 <sup>-02</sup> (3.93x10 <sup>-03</sup> )	1.63x10 <sup>-02</sup>
Uracil	4.29x10 <sup>-03</sup> (6.39x10 <sup>-03</sup> )	5.15x10 <sup>-03</sup> (3.08x10 <sup>-03</sup> )	2.23x10 <sup>-02</sup>
Lactate	2.24x10 <sup>-02</sup> (6.68x10 <sup>-02</sup> )	4.14x10 <sup>-02</sup> (8.14x10 <sup>-02</sup> )	4.12x10 <sup>-02</sup>
Acetoin	9.76x10 <sup>-02</sup> (1.55x10 <sup>-01</sup> )	2.09x10 <sup>-01</sup> (7.73x10 <sup>-02</sup> )	4.20x10 <sup>-02</sup>
N6-Acetyllysine	-6.07x10 <sup>-02</sup> (4.15x10 <sup>-02</sup> )	-4.29x10 <sup>-02</sup> (4.04x10 <sup>-02</sup> )	5.00x10 <sup>-02</sup>

**Table S15. Mean concentration in mmol/L (sd) of intracellular metabolites significantly different between SAP producers (P) and non-producers (N).**

	N	P	p-value
Threonine	1.48 x10 <sup>-02</sup> (1.62x10 <sup>-02</sup> )	1.32x10 <sup>-02</sup> (7.85x10 <sup>-03</sup> )	2.02x10 <sup>-02</sup>
Valine	2.65x10 <sup>-02</sup> (1.32x10 <sup>-02</sup> )	2.20x10 <sup>-02</sup> (1.16x10 <sup>-02</sup> )	4.63x10 <sup>-02</sup>
Pyruvate	2.45x10 <sup>-02</sup> (1.58x10 <sup>-02</sup> )	1.60x10 <sup>-02</sup> (1.41x10 <sup>-02</sup> )	4.79x10 <sup>-02</sup>